

(56)

References Cited

U.S. PATENT DOCUMENTS

4,917,553	A	4/1990	Muller	
4,961,553	A	10/1990	Todd	
5,118,233	A *	6/1992	Mitchell	411/5
5,484,123	A	1/1996	Logan	
5,624,217	A	4/1997	Hungerford, Jr.	
6,105,216	A	8/2000	Opperthausen	
6,305,650	B1	10/2001	Hawkins et al.	
6,679,461	B1	1/2004	Hawkins	
6,872,038	B2	3/2005	Westlake	
7,246,547	B2	7/2007	Van Walraven	
7,735,270	B2	6/2010	Olle et al.	

8,091,839	B2	1/2012	Whipple et al.	
8,132,992	B2	3/2012	Van Walraven	
8,181,916	B2	5/2012	Azuma et al.	
9,103,365	B2	8/2015	Whipple et al.	
2003/0049094	A1 *	3/2003	Westlake	411/84
2011/0180320	A1	7/2011	Thomas	

FOREIGN PATENT DOCUMENTS

DE	4303112	A1	8/1994
FR	1472658	A	3/1967
FR	2517411	A1	6/1983

* cited by examiner

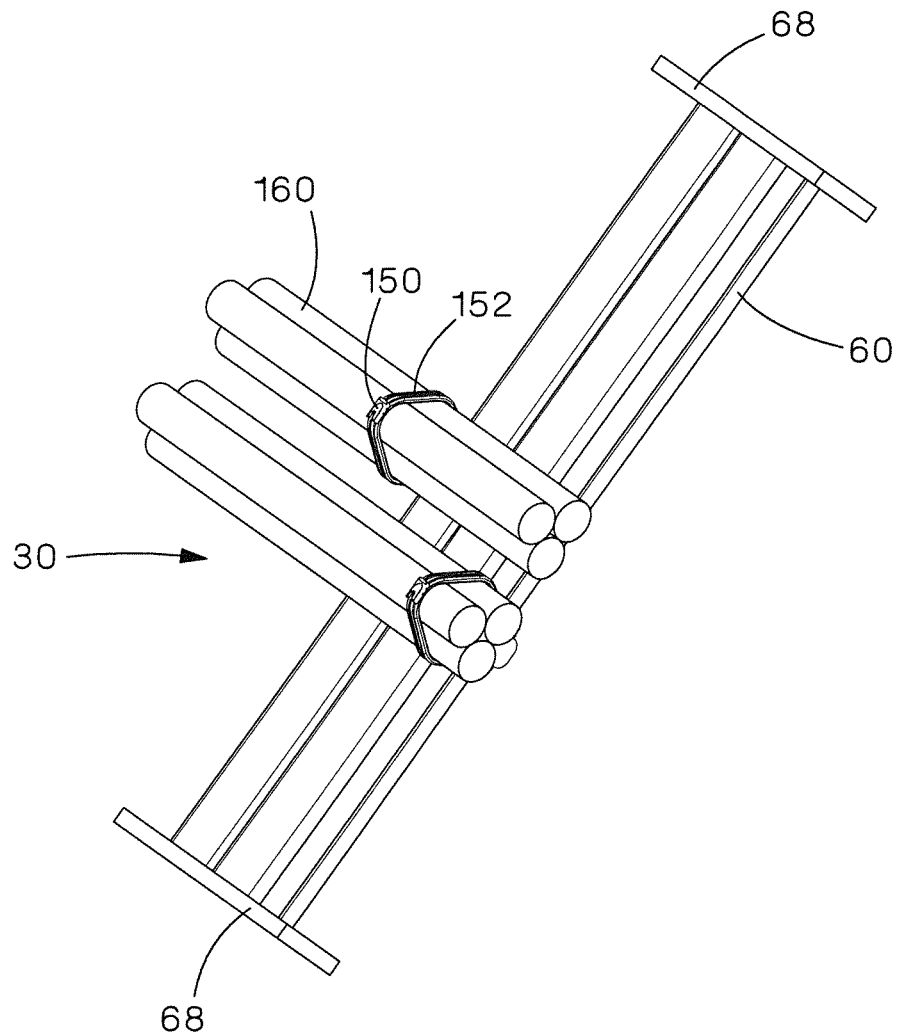


FIG.1

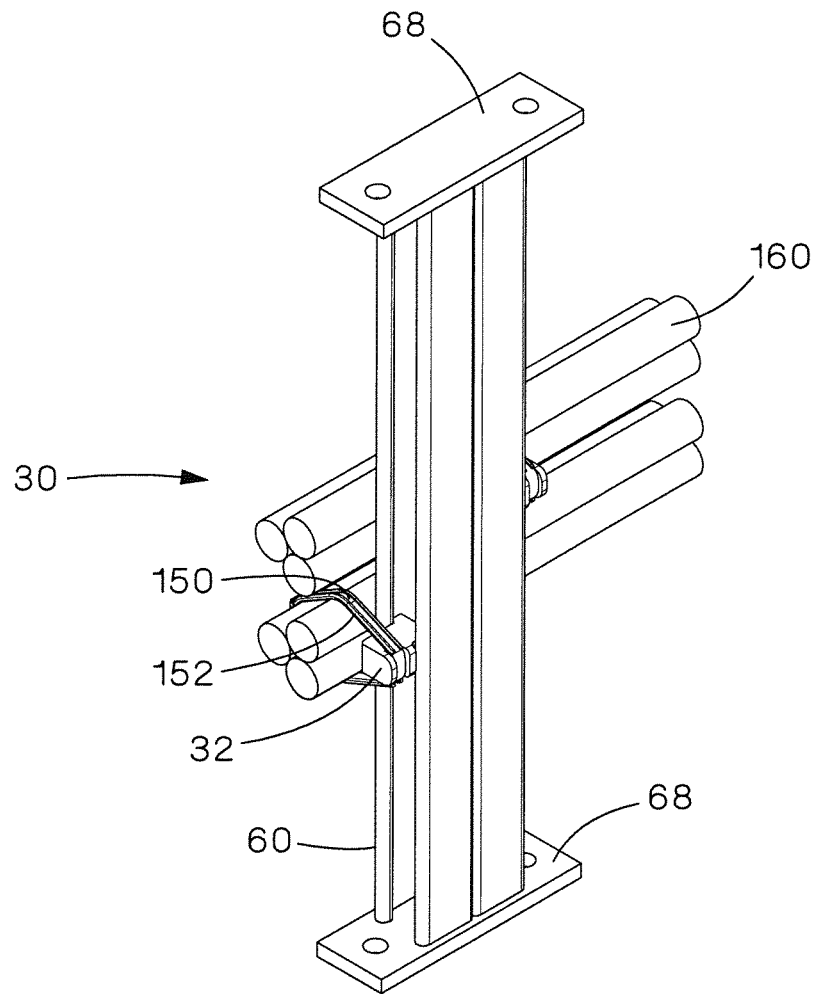


FIG.2

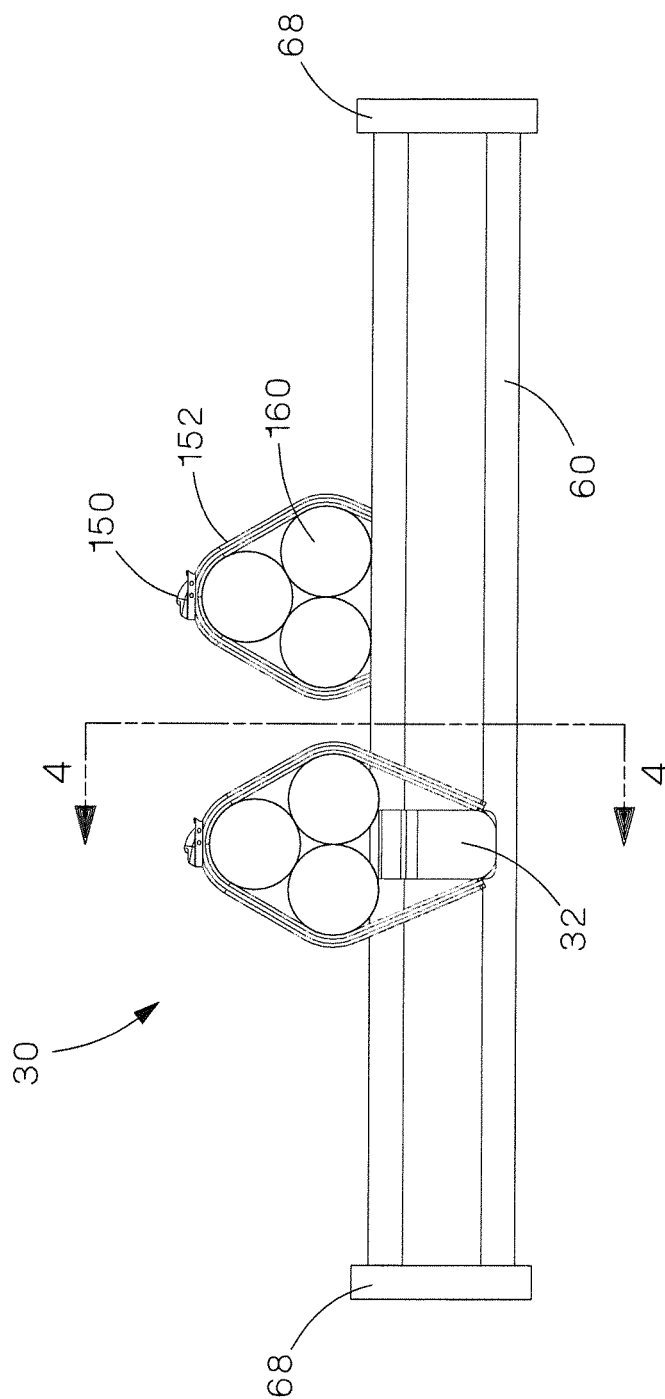


FIG. 3

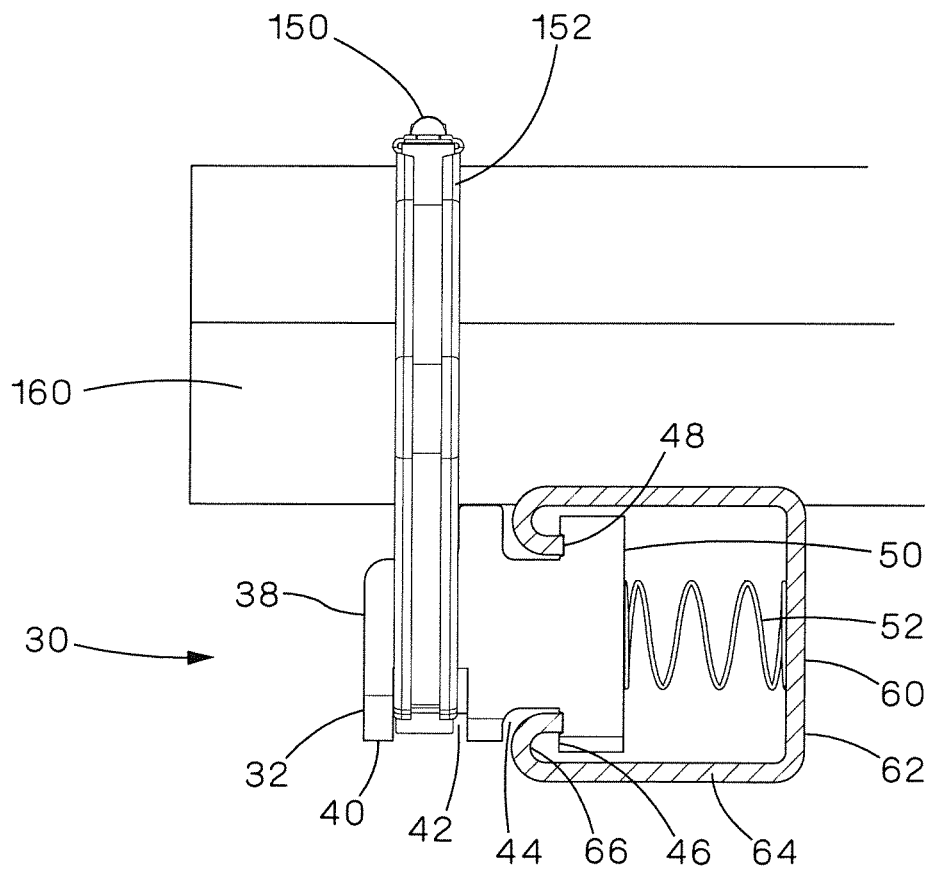


FIG. 4

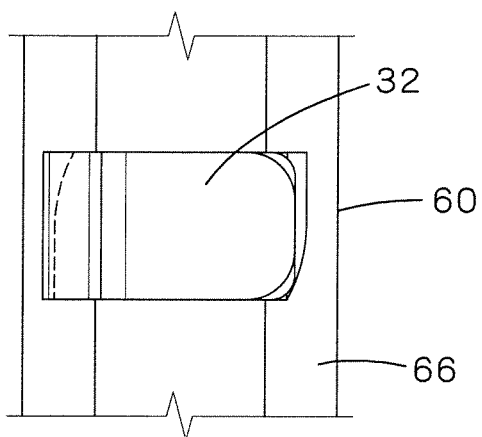


FIG. 5A

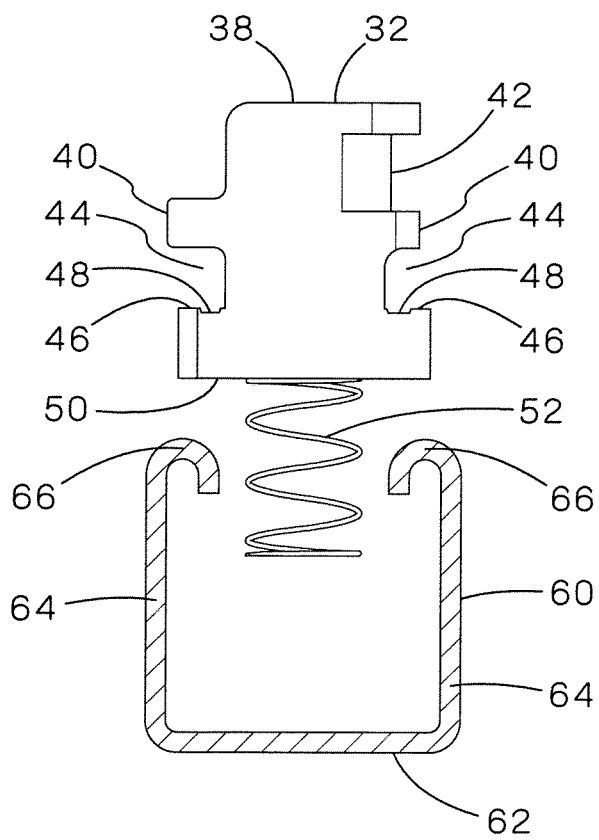


FIG. 5B

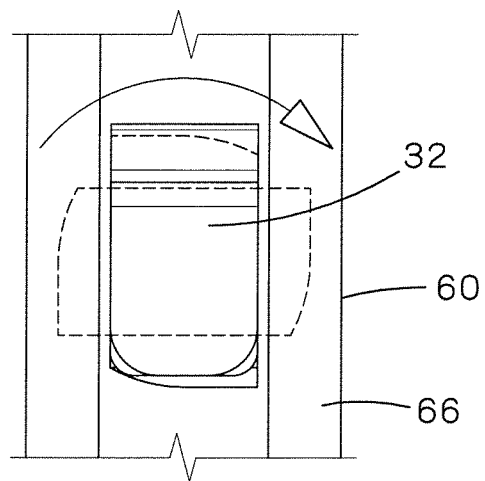


FIG. 6A

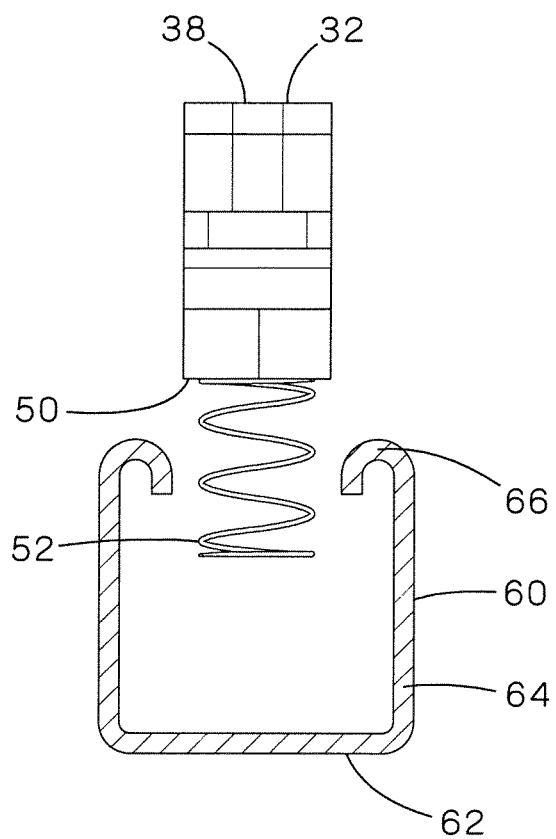


FIG. 6B

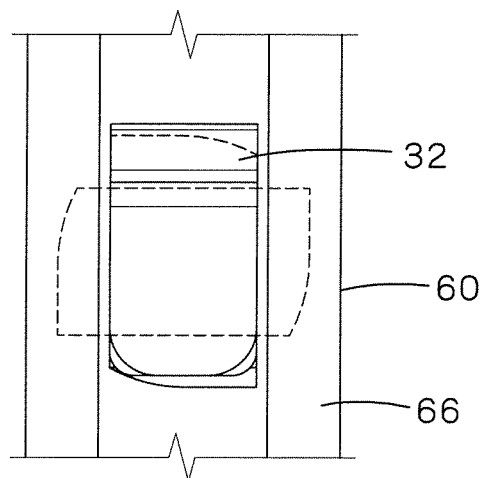


FIG. 7A

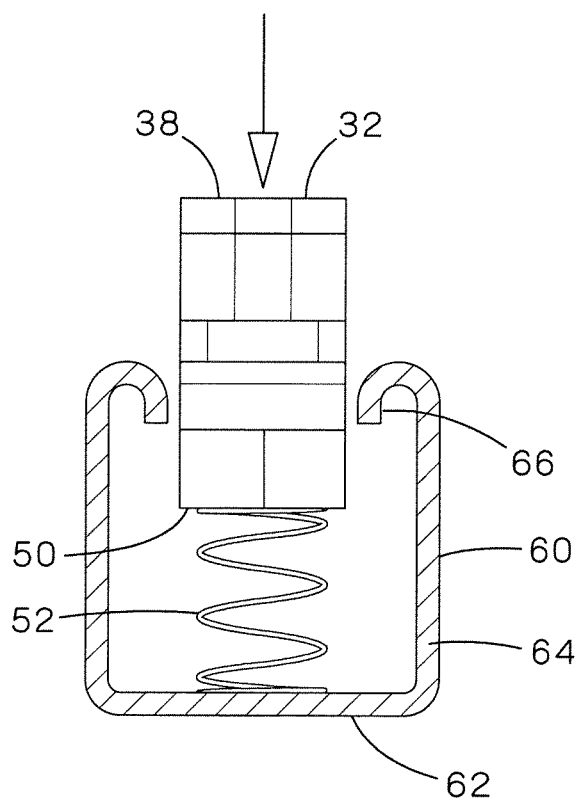


FIG. 7B

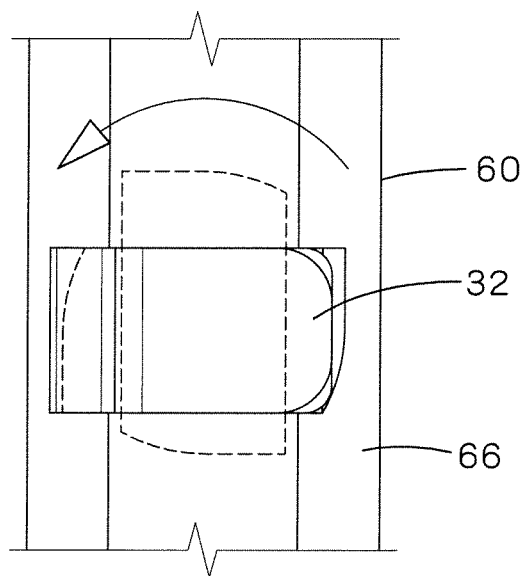


FIG. 8A

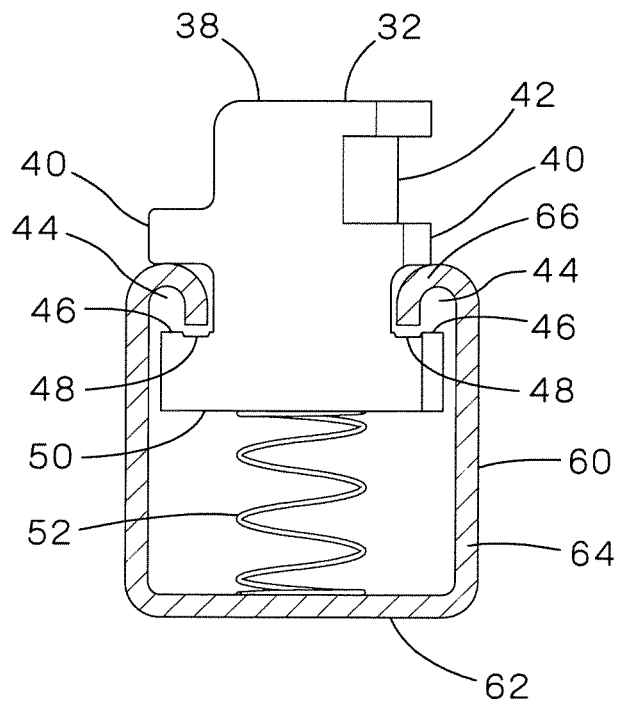


FIG. 8B

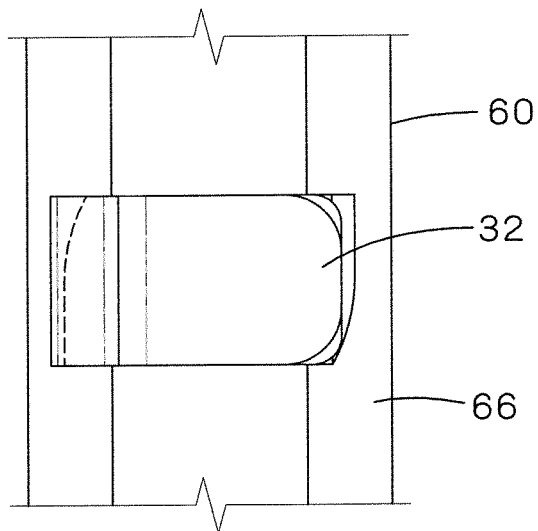


FIG. 9A

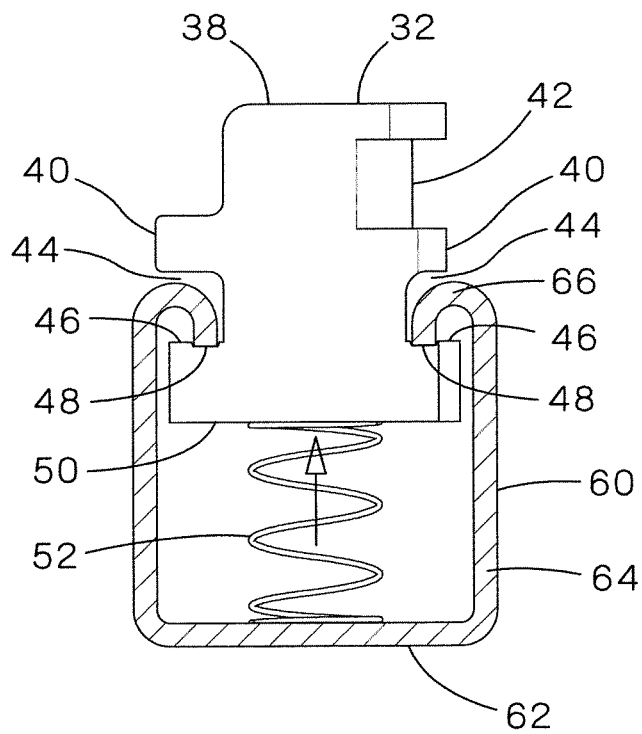


FIG. 9B

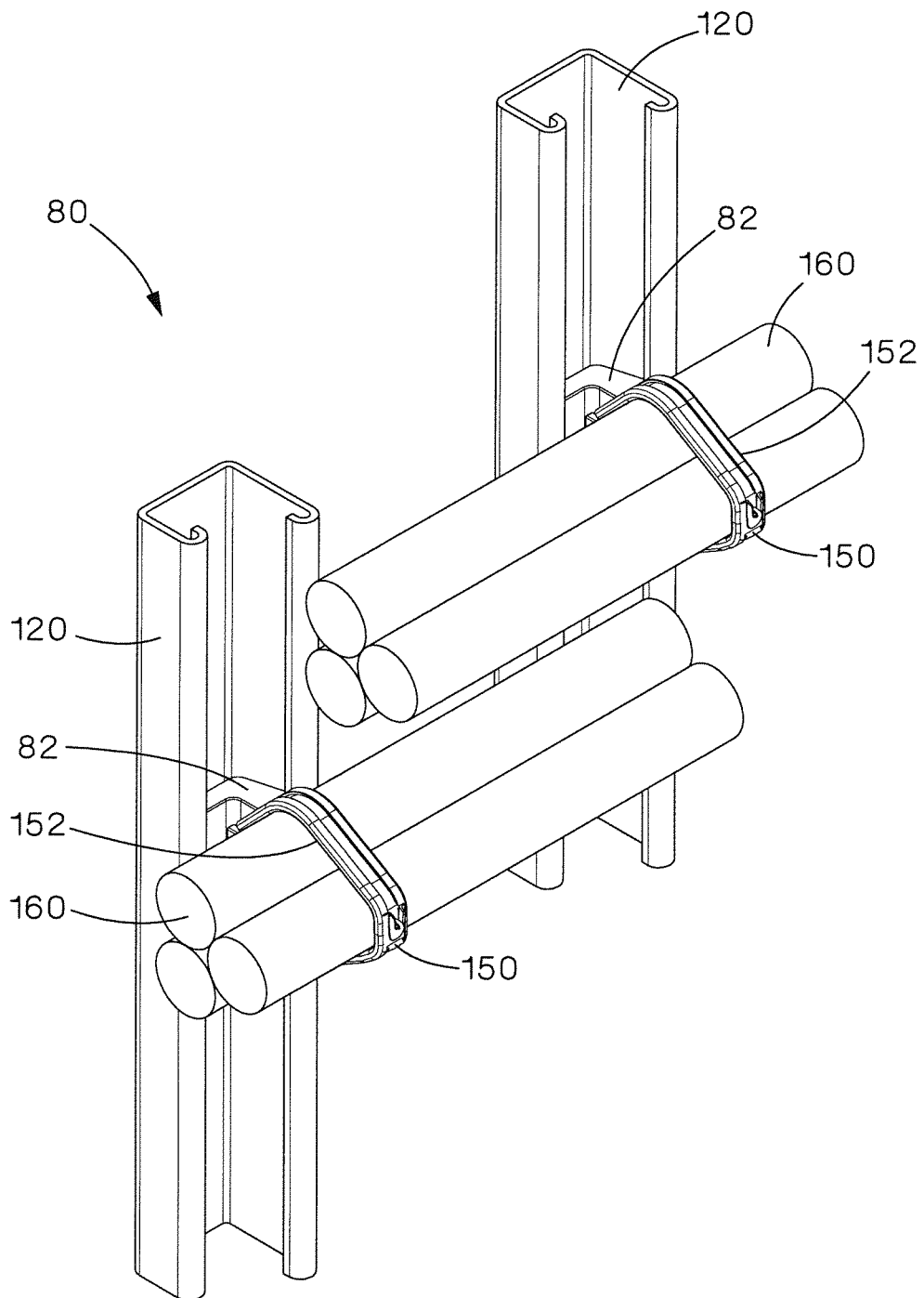


FIG.10

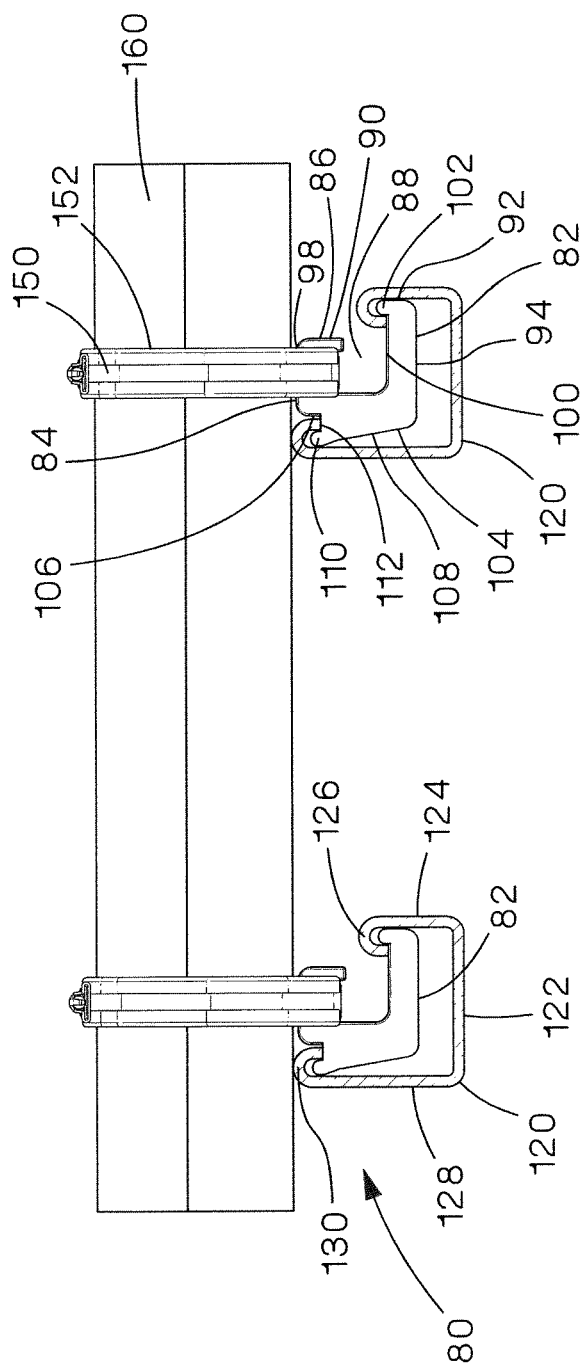


FIG. 11

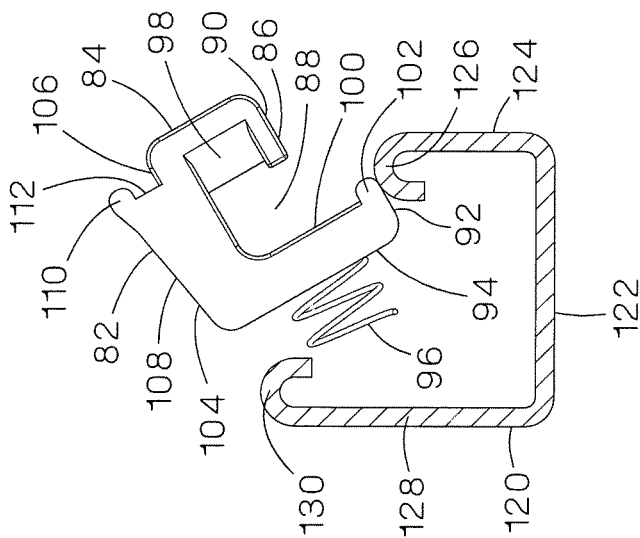


FIG. 12

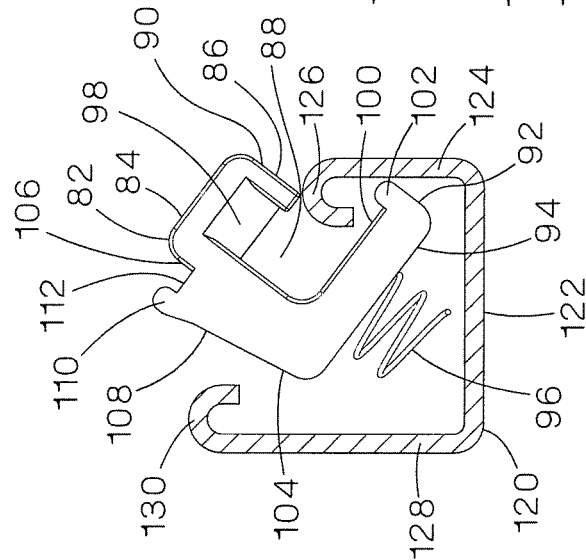


FIG. 13

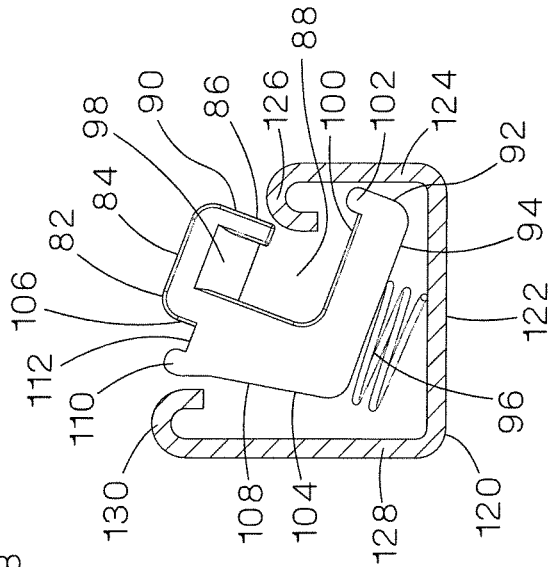


FIG. 14

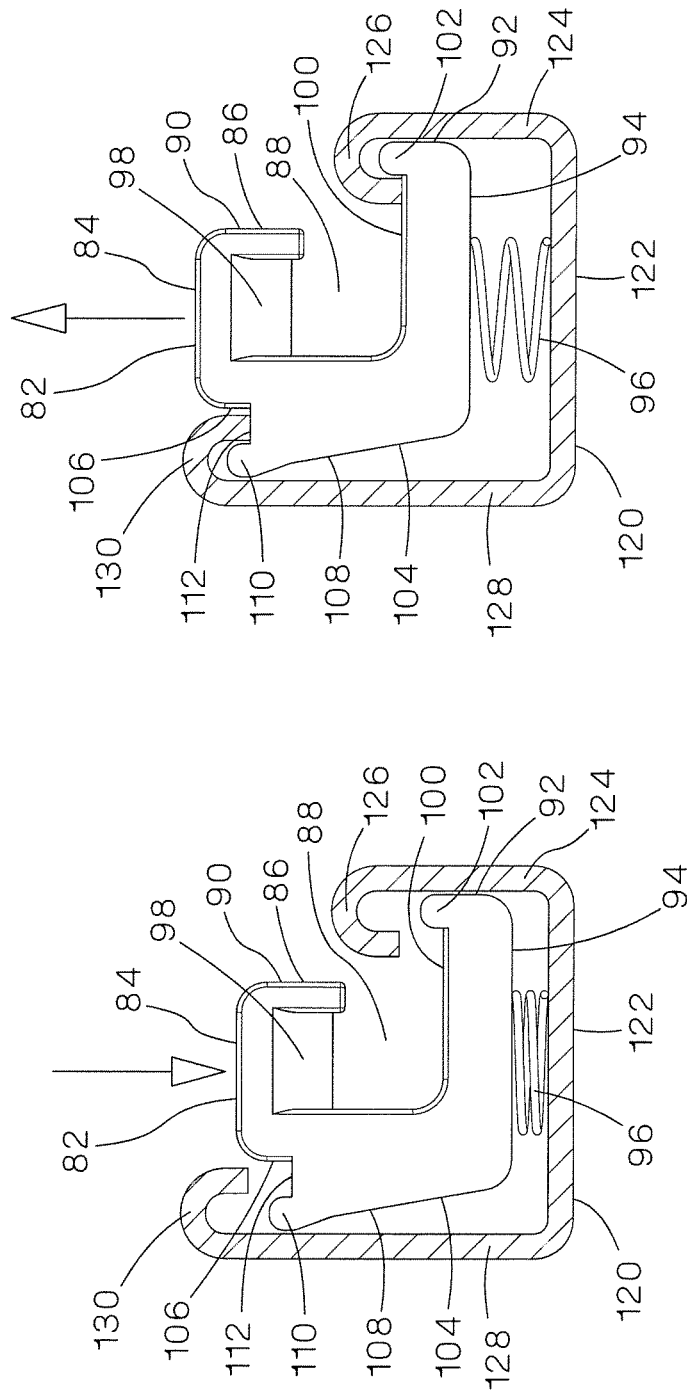


FIG. 15

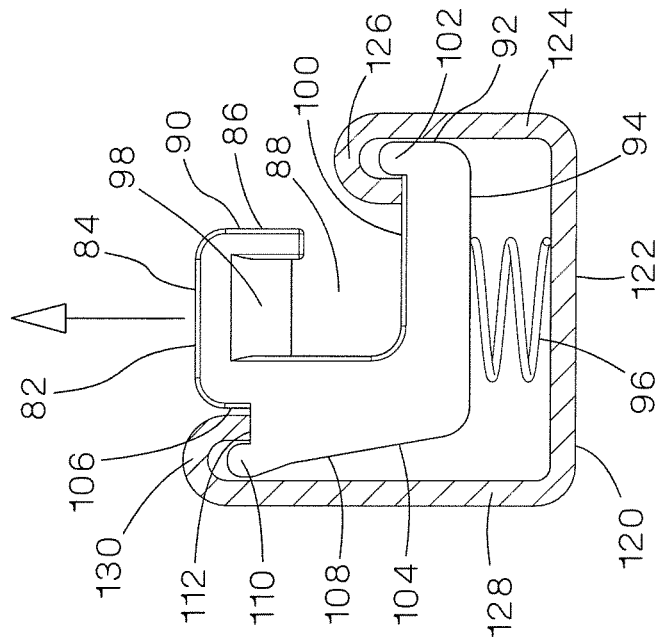


FIG. 16

1

FLANGE FOR SUPPORT CHANNEL ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application No. 61/790,584, filed Mar. 15, 2013, the subject matter of which is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

The present invention relates to a support channel, and more particularly, to a flange used to secure a bundle to a support channel.

SUMMARY OF THE INVENTION

The present invention is directed to a support channel assembly designed to support a bundle. The support channel has a bottom and two sides. Each side includes a hook at a distal end of the side. The assembly also includes a flange that engages the support channel. The flange has a top, a bottom and sides. The sides of the flange define a locking tie receiving area to receive a locking tie to secure the bundle and a support channel engaging area for receiving the hooks of the support channel.

The present invention is also directed to a support channel assembly with a support channel having a bottom, a long side, and a short side. The long side and the short side of the support channel each having a hook at a distal end. The flange has a top, a bottom, a first side and a second side. The top of the flange defines a locking tie receiving area and the first side and the second side of the flange define support channel engaging areas for receiving the hooks of the support channel.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front perspective view of a bundle secured to an outside flange installed in a support channel.

FIG. 2 is a rear perspective view of an outside flange installed in the support channel of FIG. 1.

FIG. 3 is a front view of the outside flange and support channel of FIG. 2.

FIG. 4 is a cross sectional view of the outside flange and support channel of FIG. 3 taken along line A-A.

FIG. 5A is a top view of the outside flange positioned above the support channel of FIG. 1.

FIG. 5B is a cross sectional view of the outside flange of FIG. 5A positioned above the support channel.

FIG. 6A is a top view of the outside flange rotated into position to be installed in the support channel of FIG. 1.

FIG. 6B is a cross sectional view of the outside flange of FIG. 6A positioned to be installed in the support channel.

FIG. 7A is a top view of the outside flange partially installed in the support channel of FIG. 1.

FIG. 7B is a cross sectional view of the outside flange of FIG. 7A partially installed in the support channel.

FIG. 8A is a top view of the outside flange partially installed in the support channel of FIG. 1.

FIG. 8B is a cross sectional view of the outside flange of FIG. 8A partially installed in the support channel.

FIG. 9A is a top view of the outside flange installed in the support channel of FIG. 1.

FIG. 9B is a cross sectional view of the outside flange of FIG. 9A installed in the support channel.

2

FIG. 10 is a perspective view of an inside flange installed in an alternative support channel.

FIG. 11 is an end view of the inside flange installed in the support channel of FIG. 10.

FIG. 12 is an end view of the inside flange positioned to be installed in the support channel of FIG. 10.

FIG. 13 is an end view of the inside flange partially installed in the support channel of FIG. 10.

FIG. 14 is an end view of the inside flange partially installed in the support channel of FIG. 10.

FIG. 15 is an end view of the inside flange partially installed in the support channel of FIG. 10.

FIG. 16 is an end view of the inside flange installed in the support channel of FIG. 10.

DETAILED DESCRIPTION

FIGS. 1-4 illustrate the outside flange for support channel assembly 30 of the present invention. An outside flange 32 is installed in a support channel 60. A bundle 160 is secured to the outside flange 32 via a metal locking tie 150 with a cushion sleeve 152. The support channel 60 is U-shaped with a bottom 62 and two sides 64 (see FIG. 4). The distal end of each of the sides 64 includes a hook 66. As illustrated in FIGS. 1 and 2, the support channel 60 includes end plates 68 positioned at each end of the support channel 60.

The outside flange 32 includes a top 38, sides 40, and a groove 42 defined in one of the sides 40. As illustrated in FIG. 4, the groove 42 receives the cushion sleeve 152 and metal locking tie 150. The outside flange 32 also includes cut-out notches 44 in each side 40 and a bottom 50. Each cut-out notch 44 defines a top surface 46 and an indentation 48. As illustrated in FIG. 4, the indentations 48 receive the hooks 66 at the distal end of the sides 64 of the support channel 60. A spring 52 extends from the center of the bottom 50 of the outside flange 32.

FIGS. 5A-9B illustrate the installation of the outside flange 32 into the support channel 60. As illustrated in FIGS. 5A-5B, the outside flange 32 is positioned to be installed in the support channel 60. Next, the outside flange 32 is rotated 90 degrees (see FIGS. 6A-6B) and placed in the support channel 60 (see FIGS. 7A-7B). The spring 52 is then compressed to allow the outside flange 32 to rotate 90 degrees back to its original position (see FIGS. 8A and 8B). Once the outside flange 32 has been rotated to its original position, the outside flange 32 is released allowing the spring 52 to expand and the outside flange 32 to raise towards the hooks 66. As a result, the hooks 66 at the distal ends of the sides 64 of the support channel 60 are positioned in the indentations 48 of the outside flange 32 (see FIGS. 9A and 9B).

Once the outside flange 32 is installed in the support channel 60, the metal locking tie 150 and cushion sleeve 152 are looped around the bundle 160 being secured. The metal locking tie 150 is rotated to a convenient location and tensioned by a metal locking tie tool (not illustrated).

The outside flange for the support channel assembly is an improvement over other bundle attaching devices because the installation time has been reduced and the number of parts has been reduced. The outside flange can accommodate a wide range of conduit, pipe, or cable diameters. The outside flange can be repositioned at any point along the support channel and the outside flange is compatible with common channel support systems. The outside flange is tamper resistant and provides a lower profile than traditional fastening methods.

FIGS. 10-16 illustrate an alternative inside flange for support channel assembly 80. As illustrated in FIGS. 10 and 11, an inside flange 82 is installed in the J-shaped support channel

3

120. A metal locking tie **150** with a cushion sleeve **152** secures a bundle **160** to the inside flange **82** installed in the support channel **120**.

The support channel **120** is generally J-shaped with a bottom **122**, a short side **124**, and a long side **128**. The distal end of each side **124**, **128** includes a hook **126**, **130**, respectively. The support channel **120** is designed with one side shorter than the other to enable placement of a metal locking tie **150** into the support channel **120** while the bundle **160** rests on the longer side **128**. The metal locking tie **150** is tensioned via a metal locking tie tool (not illustrated) to secure the bundle **160** firmly against the support channel **120**.

The inside flange **82** includes a top **84**, a first side **86**, a bottom **94**, and a second side **104**. The first side **86** includes an opening **88** dividing the first side **86** into an upper first side **90** and a lower first side **92**. The inside flange **82** also includes a groove **98** defined by the top **84**, the upper first side **90**, and the opening **88**. The groove **98** receives the cushion sleeve **152** and the metal locking tie **150**. The inside flange **82** also includes a top engagement surface **100** with a projection **102**. As illustrated in FIG. **11**, when the inside flange **82** is installed in the J-shaped support channel **120**, the hook **126** at the distal end of the short side **124** engages the top engagement surface **100** of the inside flange **82**.

The second side **104** includes an upper second side **106** and an angled second side **108**. The angled second side **108** extends from the bottom **94** to a projection **110**. The second side **104** also includes an indentation **112** that is defined by the projection **110** and the upper second side **106**. As illustrated in FIG. **11**, when the inside flange **82** is installed in the J-shaped support channel **120**, the hook **130** at the distal end of the long side **128** engages the indentation **112** of the second side **104**.

The bottom **94** includes a spring **96** attached at the center of the bottom **94**. As discussed below, the spring **96** enables the inside flange **82** to be installed in the support channel **120**.

FIGS. **12-16** illustrate the installation of the inside flange **82** in the J-shaped support channel **120**. FIG. **12** illustrates the inside flange **82** positioned to be inserted into the support channel **120**. The lower first side **92** contacts the outer surface of the hook **126** at the distal end of the short side **124** of the support channel **120**. FIGS. **13** and **14** illustrate the inside flange **82** being rotated and pushed downward compressing the spring **96** attached to the bottom **94** of the inside flange **82**. FIG. **15** illustrates the inside flange **82** pushed downward until the spring **96** is fully compressed and the inside flange **82** is positioned in the support channel **120**. Once the inside flange **82** is released, the spring **96** expands raising the inside flange **82** to the installed position. FIG. **16** illustrates the inside flange **82** in the installed position. The hook **126** at the distal end of the short side **124** engages the top engagement surface **100**. The hook **130** at the distal end of the long side **128** engages the indentation **112**. The inside flange **82** is held in place by the spring **96** until the metal locking tie **150** is installed.

The inside flange for the support channel assembly is also an improvement over other bundle attaching devices because the installation time has been reduced and the number of parts has been reduced. The inside flange can accommodate a wide range of conduit, pipe, or cable diameters. The inside flange can be repositioned at any point along the support channel.

4

The inside flange is tamper resistant and provides a lower profile than traditional fastening methods.

The inside flange can be added to the support channel after the bundle is installed for additional support, if necessary. The J-shaped support channel is manufactured with less steel than a tradition U-shaped channel. Thus, the J-shaped channel is less expensive and lighter than traditional support channels.

Furthermore, while the particular preferred embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the teaching of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only and not as limitation.

The invention claimed is:

1. A support channel assembly for supporting a bundle, the support channel assembly comprising:

a support channel having a bottom and two sides, wherein each side has a hook at a distal end;

at least one flange engaging the support channel, the at least one flange having a top, a bottom and sides, wherein one of the sides of the at least one flange defines a groove for receiving a locking tie to secure the bundle, and wherein the sides of the at least one flange further define a support channel engaging area; and

at least one locking tie for securing the bundle on the support channel, wherein the at least one locking tie wraps around the at least one flange and sits in the groove of the flange.

2. The support channel assembly of claim **1**, wherein the sides of the at least one flange further comprise cut-out notches, each cut-out notch defines a top surface and an indentation.

3. The support channel assembly of claim **2**, wherein the hooks at the distal end of the sides of the support channel are positioned in the indentations.

4. The support channel assembly of claim **2**, wherein the cut-out notches divide the at least one flange into an upper member and a lower member, the upper member extending outside the support channel.

5. The support channel assembly of claim **4**, wherein the groove is in the upper member and the support channel engaging area is in the lower member.

6. The support channel assembly of claim **1**, wherein the at least one flange further comprising a spring extending from the bottom of the flange, whereby the spring enables the flange to rotate from an initial position to an installed position within the support channel.

7. The support channel assembly of claim **1**, wherein the at least one flange extends partially outside of the support channel.

8. The support channel assembly of claim **1**, wherein the groove defines a first axis and the sides of the support channel define a second axis; wherein the first axis is perpendicular to the second axis.

9. The support channel assembly of claim **1**, wherein the at least one locking tie secures the bundle positioned along one of the sides of the support channel.

* * * * *